UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Project | Date | Author RMO

TITLE

FOREST INSECT SURVEY - SEASON OF 1942

PLUMAS NATIONAL FOREST, CALIFORNIA

National FS Library
USDA Forest Service
MAR 24 2014
240 W Prospect Rd
Fort Collins CO 80526

Annex 1
SB
763
.C2 P5
1942

by

Philip C. Johnson and Charles B. Eaton
Berkeley, California
December 16, 1942

U.S. GOVERNMENT PRINTING OFFICE 8—9742

SUBJECT—

INDEX NO.—

Forest Insect Laboratory
Berkeley, California
December 16, 1942

FOREST INSECT SURVEY - SEASON OF 1942
PLUMAS NATIONAL FOREST, CALIFORNIA

APPROVED BY:

F. P. Keen
Senior Entomologist, In Charge

SUBMITTED BY:

Philip C. Johnson
Associate Entomologist

Charles B. Eaton
Assistant Entomologist

FOREST INSECT SURVEY - SEASON OF 1942
PLUMAS NATIONAL FOREST, CALIFORNIA

INTRODUCTION

The 1942 forest insect survey of the Eastern Plumas Area of the Plumas National Forest and adjacent private timberlands was made by the writers during the period of October 8 to 17, 1942. This is an annual survey to determine the extent of damage to pine stands caused by the attacks of pine beetles. The survey this year made it possible to complete estimates of the damage incurred during the calendar year 1941 and to obtain a partial estimate of the 1942 damage on the mature virgin pine stands in the reporting area.

The estimates of beetle damage which appear later in the report are based upon measurements obtained from a series of roadside and compass-line strips located in representative pine stands throughout the reporting area. This method of sampling, while not yet fully perfected, was used this year to replace the 320-acre plots previously used by the survey. Most of the plots have been logged over in recent years and the two which remained were deemed insufficient to base estimates on any but a small area adjacent to them.

Estimates of the virgin timbered acreage have been corrected to January 1, 1942, with the help of cutover information furnished by the Clover Valley Lumber Company of Loyalton, California.

Two maps have been included in the report. The first (Figure 2) outlines the Eastern Plumas Area and its subdivisions and indicates the general beetle hazard ratings applied to the pine stands; the second (Figure 3) shows the road system, the location of the sample strips used in the 1942 survey and the location of logged-off lands.

Figure 2

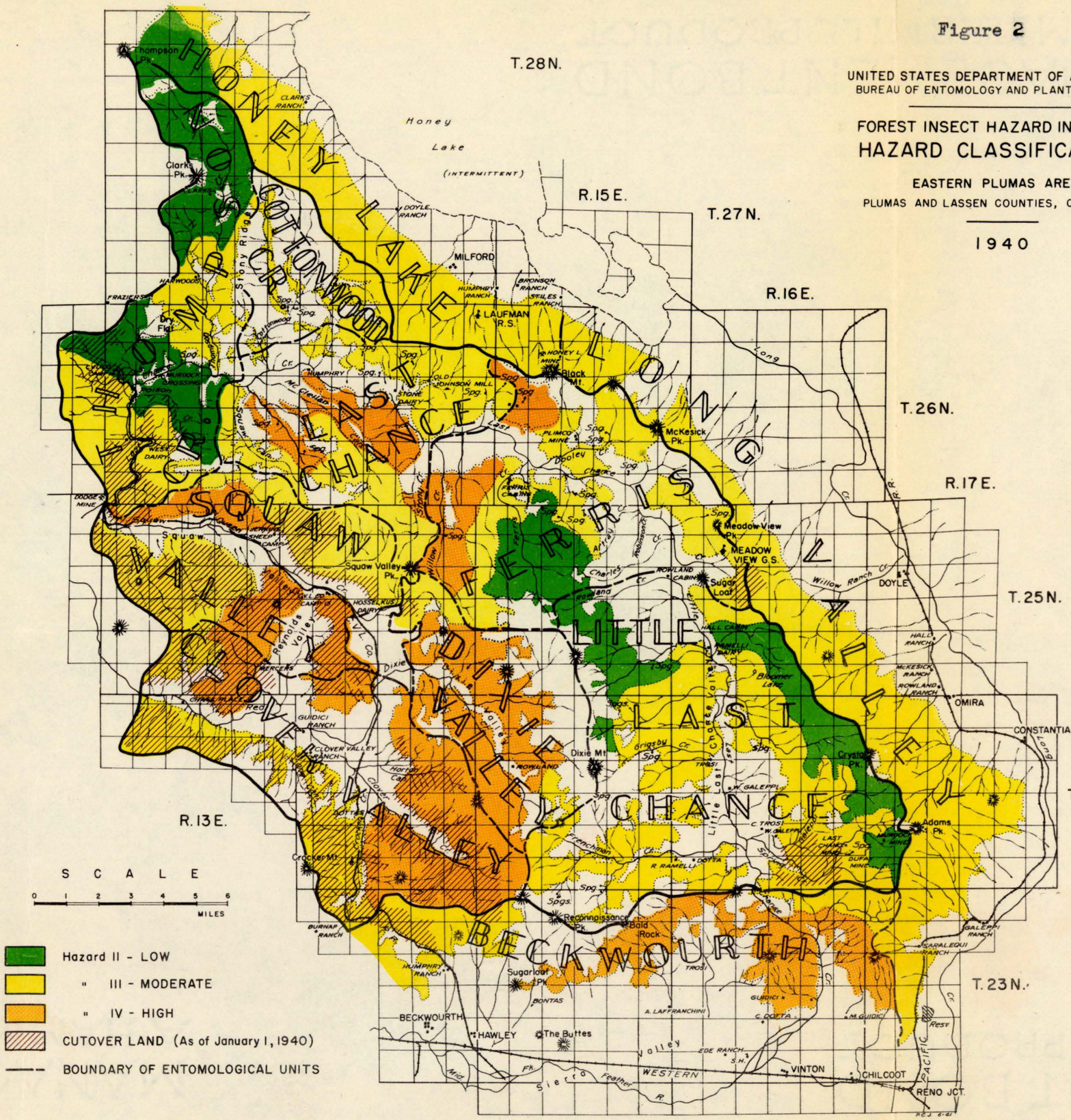
UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT HAZARD INVENTORY
HAZARD CLASSIFICATION

EASTERN PLUMAS AREA

PLUMAS AND LASSEN COUNTIES, CALIFORNIA

1940



RESULTS OF THE SURVEY

Character of the Infestation

The virgin pine stands in the Eastern Plumas Area are composed of Jeffrey pine (67 percent) and ponderosa pine (33 percent). Each of these species is attacked by different species of pine bark beetles. Because of differences in the habit of attack of these insects, the infestations in Jeffrey and ponderosa pine do not necessarily parallel each other. This has been very well demonstrated in this area where, in 1941, losses in the ponderosa pine stand averaged only 0.3 percent of the stand in comparison with an average loss of 1.0 percent of the Jeffrey pine stand. This relation was fairly constant on the sample strips measured in this year's survey, although in some the difference in losses for the two species was considerably greater than the average, as shown in the following tabulation compiled from Table 2.

Table 1. Summary of Pine Timber Losses on Sample Strips, Eastern Plumas Area, Plumas National Forest, California.

Sample Strip	Timbered Acreage	Timber Killed in 1941 Infestation: Volume (b.m.) Per Acre PP	JP	Percent of Stand PP	JP
RD-1	160	37.3	25.2	0.2	0.4
2	160	none	132.1	none	0.8
3	40	**	none	**	none
4	160	7.4	25.4	0.1	0.3
5	160	16.3	79.3	0.1	1.0
6	80	none	71.1	none	1.3
7	72	none	44.0	none	0.3
8	160	none	128.5	none	1.3
9	80	none	84.6	none	1.0
10	160	0.3	459.7	none	5.6
LS-1	40	86.8	217.5	2.0	2.5
	AVERAGES	10.8	126.1	0.1	1.4

** No ponderosa pine in stand

The condition discussed above is reflected in the summary of losses which occurred in 1941 in the reporting area and its subdivisions (Table 3). Losses in Jeffrey pine were estimated at 11,490,000 board feet, the losses in ponderosa pine at 1,810,000 board feet. The infestation in Jeffrey pine may be considered mildly epidemic and that in ponderosa pine endemic. Despite the fact that the 1941 losses were well below the average of other years the loss of this timber may be viewed with concern, especially now that the lumber requirements of the war effort have become so great.

Table 2: Pine timber killed by bark beetles on virgin sample strips, Eastern Plumas Area, Plumas National Forest, California, and adjacent private lands. Season of 1941.

ENTOMOLOGICAL UNIT	STRIP NO.	TIMBERED ACREAGE	INSECT HAZARD RATING	PINE STAND TREE SPP.	PINE STAND VOLUME (m.b.m.)	LOSS FOR 1941 NO. OF TREES	LOSS FOR 1941 VOLUME (b.m.)	LOSS FOR 1941 VOLUME PER ACRE	LOSS FOR 1941 % OF STAND
Thompson Creek	RD-1	160	II-III	PP	3,660	8	5,970	37.3	0.2
				JP	910	4	4,030	25.2	0.4
				Total	4,570	12	10,000	62.5	0.2
Thompson Creek	RD-2	160	II	PP	2,970	none	none	none	none
				JP	2,610	20	21,130	132.1	0.8
				Total	5,580	20	21,130	132.1	0.4
Honey Lake	RD-3	40	II	JP	820	none	none	none	none
Last Chance	RD-4	160	III	PP	2,310	5	1,190	7.4	0.1
				JP	1,450	5	4,070	25.4	0.3
				Total	3,760	10	5,260	32.8	0.1
Cottonwood Creek	RD-5	160	III	PP	1,880	2	2,600	16.3	0.1
				JP	1,220	10	12,680	79.3	1.0
				Total	3,100	12	15,280	95.6	0.5
Ferris	RD-6	80	IV	PP	360	none	none	none	none
				JP	450	5	5,690	71.1	1.3
				Total	810	5	5,690	71.1	0.7
Ferris	RD-7	72	III	PP	280	none	none	none	none
				JP	910	2	3,170	44.0	0.3
				Total	1,190	2	3,170	44.0	0.3
Little Last Chance	RD-8	160	III	PP	330	none	none	none	none
				JP	1,580	13	20,560	128.5	1.3
				Total	1,910	13	20,560	128.5	1.1
Little Last Chance	RD-9	80	III	PP	1,200	none	none	none	none
				JP	680	5	6,770	84.6	1.0
				Total	1,880	5	6,770	84.6	0.4
Dixie Valley	RD-10	160	III	PP	300	1	50	0.3	none
				JP	1,310	36	73,550	459.7	5.6
				Total	1,610	37	73,600	460.0	4.6
Last Chance	LS-1	40	IV	PP	170	4	3,470	86.8	2.0
				JP	350	4	8,700	217.5	2.5
				Total	520	8	12,170	304.3	2.4

Table 3. Virgin pine timber killed by bark beetles, Eastern Plumas Area, Plumas National Forest, California, and adjacent private timberlands. Season of 1941.

ENTOMOLOGICAL UNIT	PINE TYPE ACREAGE (January 1, 1942) VIRGIN	CUTOVER	TOTAL	TREE SPP.	VIRGIN PINE STAND (m.b.m.)	TREES NO.	TIMBER KILLED 1941 VOLUME m.b.m.	b.m./ac.	% stand
Thompson Creek	12,440	10,850	23,290	PP	135,580	310	230	18.6	0.2
				JP	141,470	950	980	78.7	0.7
Total					277,050	1,260	1,210	97.3	0.4
Cottonwood Creek	3,200		3,200	PP	9,050	40	50	16.3	0.6
				JP	28,420	200	250	79.3	0.9
Total					37,470	240	300	95.6	0.8
Last Chance	14,840	1,640	16,480	PP	101,580	680	470	31.6	0.5
				JP	123,570	1,550	2,340	157.7	1.9
Total					225,150	2,230	2,810	189.3	1.2
Squaw Valley	2,460	15,870	18,330	PP	7,800	240	210	86.8	2.7
				JP	30,780	250	540	217.5	1.8
Total					38,580	490	750	304.3	1.9
Ferris	10,200	1,540	11,740	PP	27,440	150	150	15.0	0.5
				JP	111,680	930	1,580	154.7	1.4
Total					139,120	1,080	1,730	169.7	1.2
Little Last Chance	26,240	1,640	27,880	PP	55,330	260	260	10.0	0.5
				JP	272,410	1,520	2,240	85.4	0.8
Total					327,740	1,780	2,500	95.4	0.8
Dixie Valley	7,350	3,840	11,190	PP	39,130	140	110	15.0	0.3
				JP	80,010	970	1,540	209.6	1.9
Total					119,140	1,110	1,650	224.6	1.4
Clover Valley	6,850	18,280	25,130	PP	6,890	90	70	10.0	1.0
				JP	56,630	430	580	84.6	1.0
Total					63,520	520	650	94.6	1.0
Honey Lake	19,020		19,020	PP	108,130	80	100	5.1	0.1
				JP	181,750	590	750	39.7	0.4
Total					289,880	670	850	44.8	0.3
Long Valley	21,660	360	22,020	PP	76,640	100	100	4.5	0.1
				JP	58,590	240	300	14.1	0.5
Total					135,230	340	400	18.6	0.3
Beckwourth	11,550	1,330	12,880	PP	10,270	80	60	5.0	0.6
				JP	89,970	310	390	33.8	0.4
Total					100,240	390	450	38.8	0.4
TOTALS FOR Eastern Plumas Area	135,810	55,350	191,160	PP	577,840	2,170	1,810	13.3	0.3
				JP	1,175,280	7,940	11,490	84.6	1.0
				All SPP.	1,753,120	10,110	13,300	97.9	0.8

The ponderosa pines infested in 1941 were scattered singly throughout the stand and were comprised principally of the more decrepit-appearing individuals in the stand. Most of them were mature and over-mature trees averaging 22 inches d.b.h. and classified as either 3C and 4C (Keen) or 5 and 7 (Dunning). Their general vigor was poor and some had been damaged by lightning or wind.

The 1941-infested Jeffrey pines were larger, averaging 32 inches d.b.h., and less restricted to the poorer vigor classes. Many of them were, by all external indications, among the healthiest trees in the stand. They occurred singly or in groups of from 3 to 7 trees usually adjacent to trees which had been attacked the previous year.

That part of the 1942 loss in both species which had appeared up to the time of the survey seemed to be made up of trees very similar in character to those killed in 1941.

Trend of the Infestation

The pine beetle situation in the Eastern Plumas country showed a marked improvement in 1941. The pine timber killed then was estimated to be 98 board feet per acre as compared to 162 board feet in 1940 and 163 board feet in 1939. The latest epidemic cycle which began in 1938 thus appeared to have been broken (Figure 1).

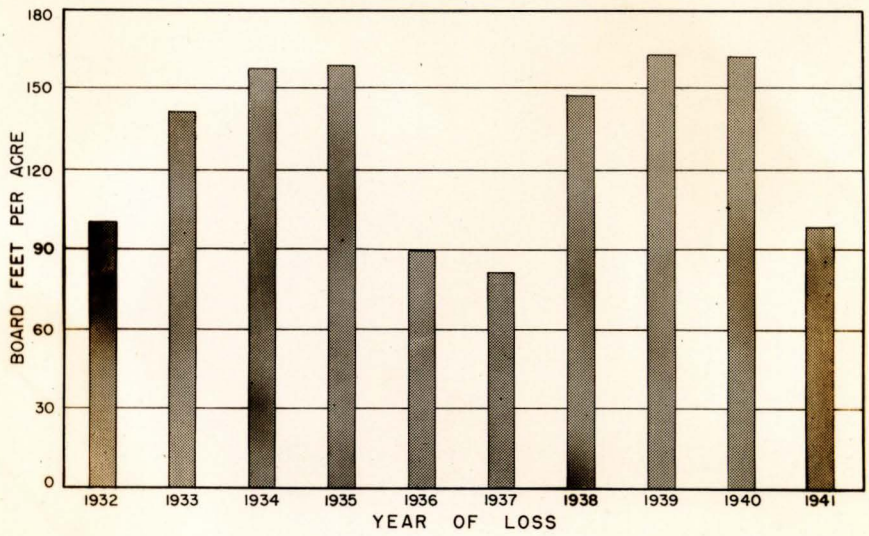


Figure 1: Ten-year record of ponderosa and Jeffrey pine timber volume killed by pine beetles on the Eastern Plumas Area, Plumas National Forest, California.

The 1942 losses will not be completely known until the 1943 survey is made, but a slight increase may be expected on the basis of the partial losses (approximately 75 percent) measured in the 1942 survey. As in 1941, the 1942 infestation will be centered primarily in Jeffrey pine.

Insects Involved

The western pine beetle, Dendroctonus brevicomis Lec., appears to be the most abundant of the relatively few insect species found in the basal examinations of the 1941- and 1942-infested ponderosa pines. A considerable number of these trees had been only partially attacked or else were devoid of any attacks.

In nearly every Jeffrey pine examined the immediate cause of death could be attributed to aggressive attacks of the Jeffrey pine beetle, D. jeffreyi Hopk. Very heavy broods of this beetle appeared to have developed in 1941. This condition was noted, too, in the 1942 attacks. The aggressive nature of the beetle presents a very disturbing picture insofar as the Eastern Plumas area is concerned. Our knowledge of its life history and habits is far from complete, but apparently it attacks both low and high risk trees. Of 97 Jeffrey pine trees killed in 1941, 37 trees, or nearly 40 percent of the total number were placed in Keen's 3A, 3B, 4A, or 4B classes. These classes include the most vigorous trees in the mature and over-mature age groups. It is not known whether the killing of vigorous trees by the Jeffrey pine beetle is limited to periods when the infestation is epidemic, as seems to be the case with the western pine beetle, or whether it continues during periods of low loss. If the latter proves to be the case, indirect control of the Jeffrey pine beetle by sanitation-salvage cutting may not be possible. However, the results of the sanitation-salvage logging operation in 1941 on the Dixie Valley area belie this thought, for the first year after cutting a loss reduction of 92 percent was secured for both species of pine.[1] For Jeffrey pine alone the loss reduction on the cut area was 82 percent. It is evident that a thorough study of the Jeffrey pine beetle is urgently needed in order that its life history and control requirements may be more fully known.

---

[1] Bongberg, J. W. Pine beetle control through sanitation-salvage logging. Dixie Valley Area. Plumas National Forest, California. Berkeley, California, 1942 - (Office report).

RECOMMENDATIONS

Proposing insect control programs under conditions of war may bring to the mind of many the thought that they are not justified because of the lack of manpower and the expenditure of funds for seemingly non-essential purposes. But when it can be pointed out that pine beetles have destroyed between 25 and 30 million board feet of merchantable timber in the short space of two years and from an area of only 135,000 acres, there is then cause to reconsider. The lumber which could have been made from this beetle-killed timber would have been in grades most needed by the war effort. The fact that the Eastern Plumas Area suffered this much depletion in its working capital can be subordinated by the loss of this timber in supplying our war needs today. Viewed in this light there is justification for beetle control under some circumstances.

There are two localities in the Eastern Plumas Area that are in need of immediate attention. These places have been designated on the accompanying map (Figure 3) by the letters A and B respectively and they are located in the Last Chance and Ferris Units.

The epidemic in the Last Chance Unit (Figure 3, A) extends over 2,700 acres of mixed ponderosa and Jeffrey pine on the north slopes, south of Last Chance Creek from Squaw Canyon eastward in parts of Township 26 North, Range 13 and 14 East. Annual losses in this locality have averaged 2.5 percent of the stand for the past two years. If, in accordance with present plans, this area is logged during 1943 as a part of the regular timber sale program of the Plumas National Forest, it is unlikely that further control measures will be needed. It is believed that cutting of the remaining timber stand on the area will reduce the infestation to the point where it will no longer be dangerous as a source of infestation in adjacent stands.

The epidemic in the Ferris Unit (Figure 3, B) is situated at the head of Willow Creek in Townships 25 and 26 North, Range 14 East, and extends through 3,800 acres of timber, primarily Jeffrey pine, on north and west slopes. It extends from the south side of the divide between Squaw Queen and Willow Creeks north for a distance of about five miles. The problem of control in this locality is more difficult than in Last Chance because losses are more severe and there are no immediate plans for cutting the stand. Previous survey records have shown that a rather persistent Jeffrey pine infestation has accounted for considerable depletion in this vicinity, and losses for the past two years have exceeded 10 percent of the green stand. If a full utilization cutting could be made here it is believed that the infestation could be controlled and the remaining timber values salvaged. The area is ideally situated for truck logging and if a sufficiently heavy cut were planned the principal logging operator on the Eastern Plumas could probably afford to handle the cut even under wartime conditions. This operator is equipped for truck logging. The only alternative to logging as a means of controlling the infestation is to institute direct control measures, and this procedure is rather difficult to justify under the circumstances.

SUMMARY

A. The 1941 Infestation (completed records)

1. Total pine timber killed on reporting area (Table 3)

   a. Number of trees — 10,110

   b. Volume — 13,300,000 board feet

   c. Average volume per acre — 97.9 board feet

   d. Proportion of virgin pine stand — 0.8 percent

2. Present classification - low epidemic

3. Primary insect - Jeffrey pine beetle in Jeffrey pine

4. Trend - substantial decrease over 1940

5. Control work completed - sanitation-salvage logging operation, Dixie Valley Unit, approximately 3,600 acres. Loss reduction in the first year after cutting, 92 percent.

B. The 1942 Infestation (partial records)

1. Primary insect - Jeffrey pine beetle in Jeffrey pine

2. Probable trend - unchanged over 1941

3. Control work recommended - in parts of the Last Chance and Ferris Units

Figure 3

FOREST INSECT SURVEYS
CUMULATIVE CUTOVER LAND

PLUMAS NATIONAL FOREST
Eastern Plumas Area